CLAIMS

What is claimed is:

1. An optical communications receiver comprising:

a plurality of spatially-separated optical detectors receiving an optical communication signal from a remote source, each optical detector further comprising:

a plurality of light sensors, and

an optical system collecting a portion of light received from the source and directing the collected portion of light toward the plurality of light sensors, the plurality of light sensors converting the collected portion of light to detected signals; and

a processor, coupled to the plurality of spatially-separated optical detectors, receiving the detected signals and combining the received signals to obtain information borne by the received optical communication signal.

2. The receiver of claim 1, wherein the plurality of light sensors comprise photon-counting sensors.

3. The receiver of claim 2, wherein the photon-counting sensors comprise avalanche photodiode sensors.

4. The receiver of claim 2, wherein the plurality of light sensors operate in nonlinear Geiger-mode.

5. The receiver of claim 1, further comprising a plurality of detector processors, each processor coupled to a respective one of the plurality of spatially-separated optical detectors for processing at least a portion of the detected communication signals.

6. The receiver of claim 1, further comprising at least one adjustable mount for pointing the plurality of spatially-separated optical detectors toward the remote source.

7. The receiver of claim 6, wherein the at least one adjustable mount is remotely controllable.

8. The receiver of claim 1, further comprising a network coupled between the plurality of spatially-separated optical detectors and the processor.

9. The receiver of claim 8, wherein the network comprises a local-area network.

10. The receiver of claim 1, wherein the plurality of light sensors are disposed on a monolithic substrate.

11. The receiver of claim 1, wherein the optical system comprises a telescope optically coupled to the plurality of light sensors.

12. The receiver of claim 11, wherein the optical system further comprises a solar baffle.

13. The receiver of claim 1, wherein the optical communication signal is modulated at a rate of at least 1 megabit per second (Mbps).

14. The receiver of claim 13, wherein the modulation is M-ary, pulse-position-modulation (M-PPM).

15. The receiver of claim 1, wherein the optical communication signal comprises an optical wavelength longer than about 1 micrometer (mm).

16. A method for receiving a free-space optical communications signal from a remote source comprising:

providing a plurality of spatially-separated optical detectors, each optical detector comprising a respective plurality of light sensors;

collecting at each of the plurality of spatially-separated optical detectors a portion of the received optical communication signal;

directing the collected portion of the received optical communication signal toward the respective plurality of light sensors;

converting at the plurality of light sensors the collected portion of the received optical communication signal to a respective detected signal; and

combining the respective detected signals from each of the plurality of spatially-separated optical detectors to obtain information borne by the received optical communication signal.

17. The method of claim 16, further comprising determining a respective delay value for each of the plurality of spatially-separated optical detectors.

18. The method of claim 17, wherein determining comprises calibrating using at least one of measuring and calculating delay values.

19. The method of claim 17, wherein determining comprises using a time reference provided within the received optical communication signal.

20. The method of claim 16, further comprising pointing the plurality of spatially-separated optical detectors toward the remote source.

21. The method of claim 20, wherein pointing comprises physically steering the spatially-separated optical detectors toward the remote source.

22. The method of claim 21, further comprising fine tuning by electronically steering the plurality of light sensors.

23. The method of claim 16, wherein converting comprises:

generating at each of the plurality of light sensors an electrical current pulse in response to detecting at least one photon;

combining at each of the plurality of spatially-separate optical detectors, the electrical current pulses forming a respective detected signal.

24. The method of claim 16, wherein combining comprises:

applying a respective delay value to each of the respective detected signals to form delay-corrected detected signals; and

aggregating the delay-corrected detected signals.

25. The method of claim 16, wherein at least some of the plurality of light sensors convert the collected portion of the received optical communication signal to a respective detected signal at different times.

26. The method of claim 16, further comprising selectively ignoring at least some of the plurality of light sensors when converting the collected portion of the received optical communication signal to a respective detected signal.

27. An optical communications receiver comprising:

means for providing a plurality of spatially-separated optical detectors, each optical detector comprising a respective plurality of light sensors;

means for collecting at each of the plurality of spatially-separated optical detectors a portion of the received optical communication signal;

means for directing the collected portion of the received optical communication signal toward the respective plurality of light sensors;

means for converting at the plurality of light sensors the collected portion of the received optical communication signal to a respective detected signal; and

means for combining the respective detected signals from each of the plurality of spatially-separated optical detectors to obtain information borne by the received optical communication signal.